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Smog Check
"*Indicators of Station Performance*"

Presented to the
California Inspection and Maintenance Review Committee

by

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Smog Check – *reduces vehicular pollution from the air*

- Requires biennial emissions testing of most vehicles in state to identify which vehicles produce emissions beyond permissable quantities.
- Requires repairs to vehicle to remove defects causing excessive emissions.
- Encourages appropriate maintenance practices so that repaired vehicles maintain performance.

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Human Element is Key

- The success of the program relies upon proper incentive and motivation for each person to do his or her part.
- ***Consumer*** – must be motivated to seek a "clean car" vs. "passing certificate."
- ***Test Technician*** – must be motivated to professionally perform an accurate emissions test.
- ***Repair Technician*** – must be motivated to competently perform cost-effective and durable repairs.

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Accuracy, Competency, Durability

- **Accuracy** of emissions testing is first *and* last critical step.
- **Competency** of repairs is next critical step.
- **Durability** of vehicle emissions system relies on customer willingness to pay for, and licensed Smog Check professionals to deliver, accurate emissions testing and competent repairs. Regular preventative maintenance of vehicle insures durability of repairs.

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Proposed Station Performance Indicators

1. Failure rates
2. Tonnage of emissions reduced per station
3. Tonnage of emissions reduced repair technician
4. Station and technician disciplinary record

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Failure Rates

- Failure rates have been, and remain, key data in analyzing performance of stations and program.
- Analysis of "expected" vs. "actual" failure rates indicates testing accuracy.
- *Expected* failure rates per station is based on the average failure probability of the set of vehicles that were tested at that station
- *Actual* failure rates are provided by VID

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Failure Rates

- Failure rates are influenced by the condition of the vehicles being sent to a particular station and the accuracy of the test performed by a technician working at that station; and

- Failure rates are ***NOT*** pre-determined by station type and indeed change over time.

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Failure Rates

- The generic "Test-Only" station initially seemed to be better at failing vehicles in higher numbers than the generic "Test-& Repair" station based upon data collected in random roadside testing between 1997 and 1999.

- Higher failure rates meant more cars being sent for repairs and higher scrutiny of post-repair emissions, thus "booking" higher emissions reductions for the program.

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Failure Rates – Current Situation

- In 2006, California uses the HEP to direct 3.44 million consumers to "Test-Only" stations for testing based upon the assumption that a "Test-Only" station does a better and more accurate job in measuring tailpipe and evaporative emissions in both initial and post-repair inspections.
- New questions have arisen about HEP accuracy.
- Program performance is maximized only if "Test-Only" stations are clearly better at accurate testing and the HEP consistently identifies likely failures.

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Failure Rates

- **Failure rates have changed between 2001-2006**
- **Test-Only** failure rates ***declined*** by ***41%***
- **Gold Shield / CAP** failure rates ***declined*** by ***8%***
- **Test-and Repair** failure rates ***increased*** by ***5%***

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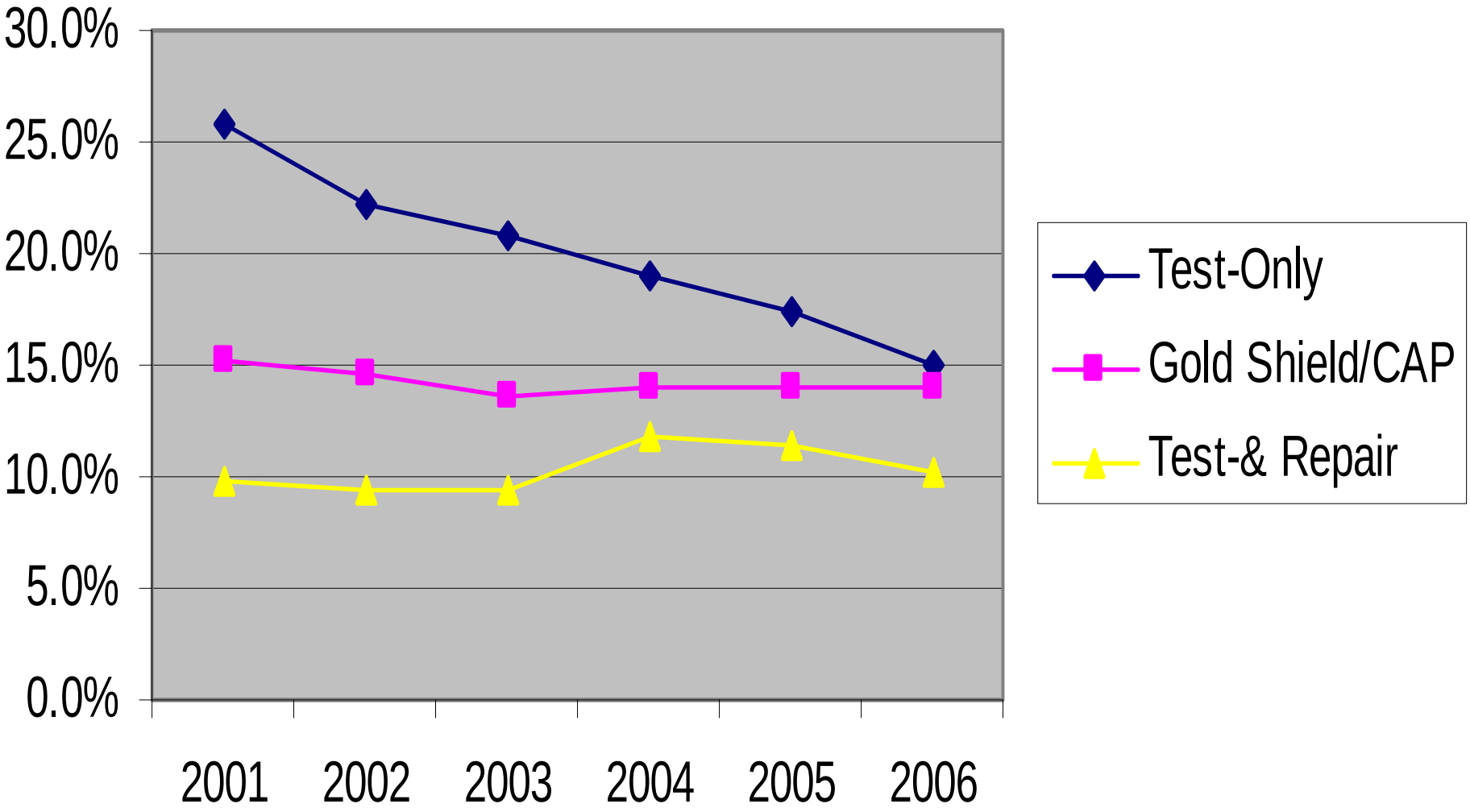
Failure Rates by Station Type



Failure Rates

- Failure rates between the three station types -- "Test-Only," "Gold Shield / CAP," and "Test & Repair"-- have converged since 2001.

- Perceived advantages to program of "higher failure rates" associated with "Test-Only" in 2000 CARB reports seems to be diminished.

Failure Rates

- "Test-Only" station failure rates still appear to be slightly higher than those achieved at "Gold Shield / CAP" and "Test & Repair" stations.

- Can this difference be explained by the fact that 6 out of 10 vehicles tested by "Test-Only" stations come from the BAR's HEP model?

- To determine one must compare failure rates for like vehicles – in this case, for non-HE cars.

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Failure Rates for HEP
BAR Data January 2005

- HEP vehicle failure rate at Test-Only stations in January 2005 was ***21.12%***
- Overall vehicle failure rate for Test-Only stations in January 2005 was ***17.5%***
- What was the non-HEP vehicle failure rate?

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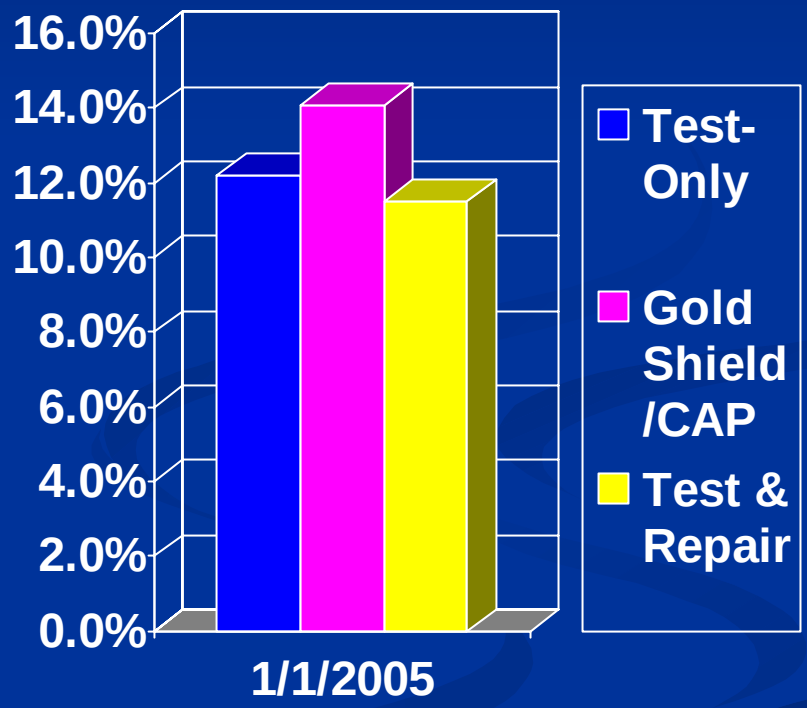
Failure Rates for Non-HEP Vehicles

BAR Data January 2005

- Non-HEP vehicle failure rate at Test-Only stations was ***12.2%***
- Non-HEP vehicle failure rate for Gold Shield /CAP was ***14.1%***
- Non-HEP vehicle failure rate for Test & Repair was ***11.5%***



Failure Rates

- Based upon failure rates "Gold Shield" stations appear to be performing the best in identifying failing emissions systems.

- BAR's roadside data for this period of time will prove important in further evaluating "expected" vs. "actual" failure rates for various stations and station types.

Program Focus on Actual Pollution Reduction

- Consumer's incentive: *passing certificate*
- Result: *least amount of investment in repairs to pass vehicle*
- Ideal consumer's incentive: *maximizing pollution reduction*
- Result: *maximum pollution reduction for each failing vehicle*
- Station's incentive: *Happy paying customers*
- Ideal station's incentive: *Customers motivated to purchase maximum repairs*

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Other Elements of Performance Evaluation

- Tonnage of emissions reduced per station
- Tonnage of emissions reduced per technician
- Licensing and disciplinary record of station
- Licensing and disciplinary record of technician

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Tonnage of emissions reduced per Test and Repair station

- Actual tonnage can be calculated using BAR's VID data and comparing individual station performance in reducing emissions to other Smog Check stations working on similar vehicles both on a regional and statewide basis.
- Various stratifications should be examined.
- BAR should provide data to both stations and technicians every six months.

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Tonnage of emissions reduced per repair technician

- Actual tonnage can be calculated using BAR's VID and comparing individual technician performance in reducing emissions to other technicians working on similar vehicles both on a regional and statewide basis.
- Various stratifications should be examined.
- BAR should provide data to both stations and technicians every six months.

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Station and technician disciplinary record

- The individual disciplinary records of both a station and technician should be taken into account as an additional factor in assessing performance.
- Impacts Gold Shield status.

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Conclusion

- Market incentives are real and need to be taken into account
- Public information about station performance can influence market dynamics
- Elements of station performance ratings can include:
  - Failure rates per station
  - Tonnage of emissions reduced per station
  - Tonnage of emissions reduced per technician
  - Licensing and disciplinary record of station
  - Licensing and disciplinary record of technician

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